

# **Food waste in the hospitality industry: How food waste mitigation affects customer's intention to visit**

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# Abstract

The growing concerns about the food waste problem in the hospitality industry have contributed to rising numbers of hotels, including food waste reduction and waste elimination in their agendas and food waste mitigation plans in their strategic plans. Extant literature and examples have demonstrated the effort of hotels to reduce food waste during their services. The present study investigated the effect of a hotel's food waste mitigation approaches on customer brand attitude and how brand attitude affects the customer's intention to visit the hotel. Respondents (N = 106) were surveyed and asked if they agreed with the importance of hotels implementing changes to reduce food waste produced in the four distinct aspects, including changing food service style, reducing portion size, providing employee training, and implementing food waste management. The findings of this study indicate that there is a significant effect of changing food service style, providing employee training and implementing food waste management in the brand attitude. However, results suggest no significant effect of reducing portion size on brand attitude. The results also show a strong positive correlation between brand attitude and customer visit intention.

Keywords: Food waste, customer decision.

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## 1. Introduction

Food waste has raised the concern of many nations, and it has become one of the global challenges. The impacts of food waste could be directly linked to food security, the environment, and the economy (Gao et al., 2021; Papargyropoulou et al., 2019). The enormous amount of food waste or losses during food production in the food service sector threatens food security (FAO et al., 2015). While more than 11 per cent of the world's population is believed to be undernourished from 2014 to 2016 (Wang et al., 2021), it raised concern about the amount of valuable and nutritious food being sent to landfills when the food could have been used to feed people (Papargyropoulou et al., 2014). Food wastage also implies insufficient use of valuable resources; approximately one-fifth of fresh water, agricultural lands, fertiliser, and energy for production, transportation, and food storage is squandered due to food waste and loss in the food production procedures. The amount of carbon footprint, water footprint and ecological footprint of food consumption and disposal have accounted for the environmental impact (Song et al., 2015).

According to the figures from the Food and Agriculture Organisation of the United Nations, it is estimated that one-third of the food produced, which is equivalent to 1.3 billion tons, is either lost or wasted (FAO, 2011). Due to the current situation, the UN has set responsible consumption and production as one of its sustainable development goals. They aim to promote the sustainable use of natural resources and reduce food waste per capita globally at retail and consumer levels by 50 per cent (UN, 2015). The increasing public interest in food waste has also attracted attention from hotels and tourism, considering that the hotel industry has contributed nearly 12 per cent to the total food waste in the last few years (Tostivint et al., 2016). For instance, the UK's hospitality and food service sector produces 920,000 tons of food waste annually, two-thirds of which could be avoided (Parfitt et al., 2013). Recent research has found that tourists tend to waste more food when travelling compared to cooking or eating out at home (Mak et al., 2018).

Current studies have investigated the effectiveness and importance of food waste reduction and waste management in hotels (Camilleri-French et al., 2019;

Leverenz et al. 2020; Pirani & Arafat, 2015). These studies focus on the supply chain and the hotels' operational side. The impacts on food waste's biodiversity and environment have also been broadly discussed (Kilibarda, Djokovic & Suzic, 2019). However, one of the hotels' most influential stakeholders, consumers, is often overlooked when exploring the topic of food waste in the hotel industry.

As the primary purpose of this research, this study intends to examine the effect of the food waste mitigation of a hotel and the customers' intention to visit the business. Since food waste has been reported and featured in the media, it has raised consumers' awareness and academic attention in the UK and worldwide (Filimonau & De Coteau 2018).

Rising numbers of hotels and stakeholders are starting to be more concerned about in the corporate social responsibility of the hospitality and tourism industry (Koseoglu et al. 2020). Therefore, numerous hotels have pledged to eliminate food waste in the near future. For example, the InterContinental hotel group (IGH) aims to reduce its food waste by 30 per cent (IHG, 2019). Hilton is also implementing AI-based technologies and aims to cut food waste by 50 per cent by 2030 (Hilton, 2020). It is still unknown that customers decisions, such as customers' intention to dine or stay with the hotels, would be influenced by the food waste prevention practices of the hotels. This research aims to investigate the effects of hotels' food waste mitigation from the consumer's perspective.

The key objective of this study is to (1) learn about the hotel customer's attitude to food waste mitigation in the hotel industry and (2) identify how the hotel's food waste practice influences customers' decisions and intentions to revisit. The customer's attitude would be assessed by the respondents' perspective of the food waste issues in hotels and if the respondents view food waste as unethical conduct of the operation. Two key research questions are raised.

RQ 1: What are the attitudes of hotel customers towards food waste mitigation in the hospitality sector?

RQ 2: How does food waste mitigation in hotels affect hotel customer's decisions?

By understanding the consumer's opinions on the matter of food waste matter in the hospitality industry, hotels could potentially better understand how their consumers perceive food waste. Therefore, hotels can reflect on their food waste management to their policies and measures regarding food waste generation in the hotel. Suppose that hotel customers' intention to visit is influenced by the food waste practice and the hotels' commitment to the environmental issue of food waste. In that case, it can address the urgency of the food waste issue in the current situation and potentially influence other hotels to contribute and put more effort into food waste mitigation since those actions could help hotels capture customers.

## **2. Literature Review**

This section provides a review of the existing studies, research and literature related to the topic of food waste in the hospitality industry as well as the choices of consumers. The literature review consists of four main components which set the frame of this study and provide a more precise direction of the research topic by spotting a gap in research and understanding the topic more from reading previous studies on the relevant topic. The first part of this chapter discusses recent studies' current food waste situation in the hospitality industry. Then, the second part of the literature review mentions the commonly discussed factors of food waste in hotels and the food service industry in previous writings. The third part explores the food waste preventatives executed by hotels as well as their food waste mitigation approach. The last part of the literature review focuses on the relationship between corporate social responsibility and customer decisions.

## 2.1 Food waste in the hospitality industry

Research and studies regarding food waste in the hospitality and food service sector often focus on delivering topics on food waste qualification, waste management; demographic factors; regulations and interventions; and composting (Dhir et al., 2020). Scholars have critically analysed the literature on the topic of food waste in the hospitality and food service sectors (Dhir et al., 2020). They found that many studies focused on aspects such as food supply chain, sustainability, food waste accounting and hospitality operations. They have stated that literature specifically on food waste in the hospitality sector is limited.

The topic of food waste has been broadly discussed and referred to by many scholars. In related literature, food waste was defined as *‘any food that is not consumed by humans and can be generated at any level within the food chain’* (Okazaki et al., 2008., p.2483). Their study examines the data from multiple food waste generator categories, including medical facilities, supermarkets, food banks, food manufacturers, restaurants, retailers, hotels, etc. The results have indicated that the hotels/ banquet/convention kitchens category has a high recycling rate of its establishments waste compared to other food waste generator categories. Their study has also found a positive correlation between the size of the establishments and the amount of food waste recycled. They have suggested that establishments with more employees tend to have a higher recycle rate of their food waste. The EU Waste Directives has interpreted waste as *‘any substance or object which the holder discards’* (Directive, 2008). However, researchers Filimonau & De Coteau,(2019) have argued that the definition of food waste is subjective, as food leftovers could be considered worthless by consumers, which could be useful in other aspects, therefore, valuable from another perspective.

Prior research has distinguished several types of food waste, which commonly contribute to the waste generation of hotels (Camilleri-Fenech et al., 2020; Dhir et al., 2020). Table 1 illustrates common types of food waste in hotels and their characteristics mentioned in previous studies.



<b>Common types of food waste in hotels</b>	
Types of food waste	Characteristics
Avoidable food waste	Food that was edible at a time and could be consumed, but has become inedible at the time it was reached
Unavoidable food waste	Food that contains inedible items. i.e., bones or eggshells.
Preparation Waste	Food that is discarded during food preparation due to undesired state of the food. i.e., rotting, burning, or it does not meet the necessary quality expectations.
Direct Waste	Waste generated by consumers during consumption
Additional waste	Food preparation waste, along with waste during service to customers.
Potential avoidable waste	Food that is edible and occasionally consumed, but not always. I.e., Potato peels
Food loses	Food that are wasted in the supply chain.

*Table 1. Types of food waste in hotels (Camilleri-Fenech et al., 2020; Dhir et al., 2020)*

When food is wasted, valuable nutrition is discarded, and scarce resources like land and water that are input during the food production process are lost (Priefer et al., 2016). Food waste has also directly correlated with greenhouse gas emissions (Jeswani et al., 2021; Priefer et al., 2016). Priefer et al., (2016)

mentioned that Europe releases more than 170 Megatons of Co<sub>2</sub>-eq due to food waste, which translates to for every tonne of food waste, 1.9 tonnes of Co<sub>2</sub>-eq is released. Meanwhile, the global greenhouse gas emission caused by food waste is almost 3.5 gigatons, which is twenty times higher. While the globe is focusing on reducing greenhouse gas emissions and mitigating carbon footprints, food waste alone is a significant contributor to aggregate greenhouse gas emissions (Priefer et al., 2016). They have also pointed out that although the total wasted amount of meat products is significantly less than vegetables, fruits and cereal, meat products are counted for the most extensive consumption resources as well as greenhouse gas emissions. The study also highlighted some of the main factors of food waste generation in the hospitality sector. These factors are oversized dishes, hygiene rules and policies, e.g., unrefrigerated products for over an extended period has to be discarded, offering all-you-can-eat style meals at fixed price encouraging customers to take more than they can consume, inaccurate demand forecasts and use of individual portion packs, e.g. jams, milk and juices that do not meet the customers' needs.

While hotel food wastage is becoming more aware of and is being featured in the media (Filimonau & De Coteau, 2018), it started to grab the public's attention on the topic of food waste. The public is becoming increasingly concerned about food waste's impacts. A recent case study of Malaysian food waste in the hospitality industry has suggested that the food waste issue is more serious than what the public thought (Papargyropoulou et al., 2019). In the five operations they have investigated, about one-third of the food is wasted or discarded during preparations. Half of the waste is avoidable. Another case study focused on a leading five-star hotel in Malta (Camilleri-Fenech et al., 2019). They have investigated the effectiveness of waste reduction initiatives in the hotel. They have recorded that the hotel generated more than 170kg of food waste daily. On average, each customer wasted 1.2 kilograms of food in their breakfast buffet. While in Germany, the hospitality sector generates around 80,000 tons of food waste annually, equivalent to more than 130g of waste food every meal (Leverenz et al., 2020).

## 2.2 Drivers of food waste in the hospitality sector

### 2.2.1 Type of food service

Various factors contribute to food waste generation in the hospitality industry (Juvan et al., 2021). Some recent research and studies have emphasised the food waste generation of the buffet and all-you-can-eat style meal type (e.g. Camilleri-Fenech et al., 2020; Dolnicar, Juvan and Grün, 2020; Jeswani et al., 2021; Juvan, Grün & Dolnicar 2017; Papargyropoulou et al., 2019). A study on the solid waste generation of a five-star hotel on Malta island (Camilleri-Fenech et al., 2020) found that buffet-style dining usually generates a reasonable amount of waste. In an 'All you can eat' style restaurant, quantity and variety of food is often the restaurant's selling point. Thus, diners tend to overfill their plates with various food, which is often more than they can manage. Their interview with the hotel staff has pointed out that waste behaviour is more familiar with consuming sweets in buffets. Customers take every item on display, only eat a fraction of it, and discard the rest. The data collected from their case study also indicates that the average waste of customers in the buffet dinner is significantly more than a-la-carte dinner. Their audits show that the average waste per customer in a-la-carte dinner is about 0.16 kg. In contrast, the average waste per customer is three times more in the buffet dinner, with 0.48kg per customer. Not only are customers overfilling their plates in buffets causing lots of plate waste, but researchers (Camilleri-Fenech et al., 2020) also claimed that overproducing of food at the buffets also contributes to food waste at the hotels, as they are afraid of running out of certain food items for their customers.

As opposed to a la carte service, the food waste generation in buffets is often influenced by the guests' food consumption practices, values, and cultural beliefs (Papargyropoulou et al., 2016; Papargyropoulou et al., 2019). Papargyropoulou et al. (2019) observed that the excessive plate food waste generation in a buffet-style restaurant is often associated with the guest's perception of the 'value of money', and the researchers discovered that the customer's perception of the 'value of money in an 'All you can eat' style restaurant is often referred as quantity rather than the quality of the food offerings. They have also mentioned that cereal, vegetables, and fruits are the most common types of food wasted in

buffets of hospitality and food service operations. With more than a third of food waste being carbohydrates such as rice, pasta, or bread, it was often associated with those plate components perceived as a "cheap filler" by the customers.

Despite the customer's perceived value of 'value of money increases the food waste generation of the restaurant, the customer's age and origin have also been found to influence plate food waste generation in an 'All you can eat 'setting restaurant. Juvan, Grün & Dolnicar (2017) assessed multiple attributes and factors which may contribute to plate food waste generation in a four-star Slovenian hotel. They have discovered a significant effect of the country of origin on food waste generation. Their study shows that Austrian guests produce, on average, significantly less plate food waste compared to other nationalities. Meanwhile, Russian guests produce substantially more food waste than guests from different origins. Their study also supports that younger diners tend to have more leftovers since children tend to stack and pile food on their plates in breakfast buffets. The results of their study indicated that the customers' backgrounds and cultures would impact the restaurant's food waste generation (Juvan et al., 2017).

### 2.2.2 Portion size

The portion size of the dish has also been commonly blamed on the food waste generation in the hospitality sector (Engström & Carlsson-Kanyama, 2004; Filimonau et al., 2021; Jeswani et al., 2021; Kantor et al., 1997). Previous studies have found that a smaller plate size results in less plate waste in the catering and hospitality sectors (Brochado & Freedman, 2009; Kallbekken & Sælen, 2013). In a quasi-experimental study, Brochado and Freedman (Brochado & Freedman, 2009) evaluated a smaller paper bag to serve french fries in an all-you-can-eat dining facility. The results of the experiment suggested a negative correlation between portion size and plate waste, indicating that reducing the size of the portion led to less plate waste generation. It aligns with the findings of Kallbekken & Sælen (2013), their study across fifty-two hotel restaurants with reported data that smaller plate size size reduces food waste by 19.5 per cent The

results suggest a strong association between plate size and plate waste generation by guests. The study indicated that a one centimetre reduction in plate size could lessen up to 2.5kg of food waste. The research has also discovered that hotel guests are more responsible when a social cue is displayed at the hotel buffet. With the sign pointing out to buffet diners that they could help themselves more than once, it encourages guests to load less on their plates, thus preventing the amount of plate waste. The outcome shows that the sign helps reduce food waste by twenty per cent, meaning that diners became more responsible when the social cue was displayed in a buffet restaurant (Kallbekken & Sælen, 2013). However, a study (Pirani & Arafat, 2015) has revealed that smaller serving plates only reduce plate waste in some circumstances. In their observation of the hotel's lunch buffet, when restaurant guests are allowed as many plates as they wish, the effectiveness of reducing plate waste by providing smaller plates may be limited.

Filimonau et al. (2022) have studied the food waste pattern and critically analysed the food waste issue of twenty-two commercial food operators. They have pointed out that restaurants offering a more considerable portion may associate with higher guest satisfaction as they see a substantial portion as value for money. Therefore, reducing the portion size might face the consequence of reduced customers.

### 2.2.3 Employee skill levels

When studying the drivers of food waste in the hospitality and food service industry, the employee skill level is correlated to the food waste generation of the establishments (Dhir et al., 2020; Kasavan et al., 2019). In some consumption markets, customers are often blamed for being the main drivers of food waste generation (Filimonau et al., 2019; Papargyropoulou et al., 2019). Customers are accused of ignoring and not thinking about the environment as well as the societal impacts of food wastage when they dine out (Filimonau et al., 2019). Nonetheless, employees may have more impact on food waste generation. In the case study of food waste generation in five Malaysian hotels by researchers (Papargyropoulou et al., 2019), the proportion of the preparation waste of the

total food waste in operation has a much more significant variation than customer waste and buffet waste. The data shows that most of the observed hotels have high preparation waste, and avoidable waste accounts for most of the preparation waste, suggesting that the restaurants have control over the issue itself. Employee skill level impacts the amount of avoidable waste in the food production process, as observed by researchers (Papargyropoulou et al., 2019), poor cutting skill, for instance, is a factor in high food preparation wastage, for example, younger and less experienced kitchen staff cutting too much of the edible part of the fruit when peeling the fruit.

Ingredients and food products should be handled with care in the food production process, properly storage, handling and distribution of the food can reduce the chance of deterioration of fresh ingredients such as dairy, vegetables and meat (Okumus et al., 2020). Hospitality and food service employees are encouraged to minimise food loss by complying with waste preventatives such as first-in-first-out storing method. Inappropriately storing, handling, and distributing food by the workers can lead to food breakage, spoiling, bruising, pests, infection disease, spillage, contamination and drying out of food (Parfitt, Barthel & Macnaughton, 2010), especially for perishable items. In addition, serving errors, cooking errors, and over-preparation of food also contribute to food waste in the hospitality industry (Okumus et al., 2020). Hence, food knowledge and awareness of the food handling employee is essential. Not only could they prevent avoidable waste in the food production process, but they also have the power to save economic costs for the business. Researchers Ko & Lu (2020) have studied the professional competency of the kitchen staff and food surplus. In the research, twenty experts from the industry, government and academic institutions were surveyed about the importance of the professional competence of the kitchen staff regarding food waste issues. From the responses of the experts, knowledge on how to store various ingredients, following the concept of first-in-first-out and knowing how to clean and handle the ingredients properly to avoid decomposition of the food are the most important for the kitchen staff to avoid food wastage. At the same time, paying attention to the ingredient's freshness and the idea of not wasting food are the most critical attitude factors for the kitchen staff.

#### 2.3.4 Food waste management

Hotel managers tend to treat obstacles involving more efficient use of natural resources, such as food waste, as money and cost-saving opportunity for the business in the short term (Filimonau & De Coteau, 2019). Despite the financial improvement such as cost reduction, when managers utilise resources and eliminate wastage from the production process, hospitality managers only sometimes consider environmental aspects since they are more concerned and interested in short-term profit generation. Filimonau & De Coteau (2019) also stated that it is vital to show hoteliers the immediate financial benefits of food waste mitigation and the positive impact on the business's corporate image. Martin-Rios et al (2018) conducted interviews with professional experts regarding food waste management. Questions related to waste management, client waste perception, waste management attitude and motivation towards waste management were asked. The result shows that the main drivers for the managers to adapt waste management initiatives are favourable cost analysis, experimentation with management practices and change in the current business model. The study also stated that managers are focusing on and prioritising the quality and price of the products and suppliers rather than concerning the environmental impacts and sustainability. Most of the respondents need clarification on the cost of waste management and are unaware of the amount of food waste their establishments generate. It only concerns the managers when the business must comply with regulations and legislation, such as the tax on waste (Martin-Rios et al., 2018).

Many scholars have emphasised that hotel or restaurant managers play an essential role in food waste mitigation. They are responsible for the food waste generation of the establishments in some form or another (Dhir et al., 2020; Filimonau & De Coteau, 2019; Filimonau, 2020; Principato et al., 2018; Martin-Rios et al., 2018; Okumus et al., 2020). Inaccurate demand forecast has been named one reason for food waste or food loss in the hospitality industry (Okumus et al., 2020). Some hotels would intentionally prepare more food in order to prevent getting out of stock. For example, in the case study of Malaysian hotels (Papargyropoulou et al., 2019), some hotels would have a policy such as preparing 30% more than what is actually needed to prevent running out of



particular food in banqueting events. Such policy leads to systematic overproduction of food, hence causing food waste. Hotel managers should review their policies and prevent an enormous amount of food waste generation by preparing only what is needed. Improving the reservation system can result in more accurate demand forecasts, therefore, reducing the amount of avoidable food waste.

Poor hotel management and policy have also been mentioned in another study as a contributor to food waste in hotels (Kasavan, 2019). The research is focused on food waste drivers and waste management in hotels based in Langkawi, Malaysia. Respondents from their in-depth interview with hoteliers agreed that the amount of food waste generated correlates to hotel procurement policies and management systems. Excessive production and cooking of food to meet unpredictable demands and to avoid last-minute cooking have been blamed for driving the food surplus. Poorly menu portion design is also the reason for a large quantity of plate waste in the hotels, often, hotels only provide one standard portion of the menu, but there needs to be a customised version for guests with less appetite, such as children and seniors. Food is also being discarded due to the hygiene policy of the hotel, and some hotels have policies controlling how long the food can be served at the buffet. Food cannot be served anymore after four hours at the buffet table due to hygiene and safety reasons, even when the food is in good condition and suitable for human consumption. Moreover, managers are also responsible for training and educating their employees since it could reduce the chance of employees making errors when preparing the food as well as raising awareness of the employees regarding the matter of food waste (Kasavan, 2019).

### **2.3 Food waste mitigation**

This section explores the food waste mitigation approaches (Aschemann-Witzel et al., 2015; Dolnicar et al., 2020; Okumus et al., 2020; Paparyropoulou et al., 2019; Principato et al., 2018), managers' attitude towards food waste management (Filimonau, 2020; Martin-Rios et al., 2018; Sirieir et al., 2018) as well as some hotels' food surplus preventatives. Learning about the state-of-art of food waste mitigation in the hospitality industry from previous studies and



literature provide deep insights into the current trends and practices in the industry. It also allows us to understand the hotels' attitudes, proactiveness, willingness and awareness on the topic of food waste mitigation. Extant research in food waste prevention methods shows the effectiveness of various approaches and demonstrates what scholars and experts in the field see as food waste mitigation approaches (Filimonau, 2020).

Researchers have suggested several approaches to food waste mitigation in the hospitality industry; these measures including redesigning menu and portion size (Goh & Jie, 2020), raising customer awareness (Martin-Rios et al., 2018), technology use (Filimonau & De Coteau, 2019), provide staff training (Ko & Lo, 2020) and providing takeaway containers for an unfinished meal (Sirieix et al., 2017) could help hotels tackle the global challenge of food waste. Another research has also demonstrated that respondents think it is practical to implement modern technology to reduce food waste (Okumus et al., 2020). Besides, communication and staff training would effectively minimise food waste in the preparation process (Papargyropoulou et al., 2016).

In the previous studies of the hotels, a-la-carte style service produced substantially less food waste than buffet-style restaurants (Papargyropoulou et al., 2016; Pirani & Arafat, 2016) since a-la-carte style is cook to demand rather than preparing more food than what is needed, food in buffet restaurants also risks being discarded due to hygiene regulations, therefore switching from buffet to a-la-carte is a way to reduce food waste. In the study by (Camilleri-Fenech et al., 2020), redesigning the menu helped reduce food waste generation from their restaurant. They have discovered that complementary food is often wasted. In their study, it is the potatoes and vegetables which are served with the main course. They stopped serving the side dishes and made the guest pay for the items as they wished to have them with the main course. As a result, the mean of the waste dropped by more than five per cent (Camilleri-Fenech et al., 2020).

While the advancement in technology could help hotels forecast the supply and demand for food much more accurately (Filimonau & De Coteau, 2019), providing training in efficient meal planning could reduce food waste at the

preparation stage (Kasavan et al., 2019). The kitchen staff also needs pay more diligence, to adapt to situations and the ability to prepare a decent quality meal. Training on employee cooking skills can improve their products could lower the chance of unsatisfactory dishes, hence reducing plat waste from customers. Moreover, better-trained employees will be less likely to make mistakes during food preparations, such as cooking with the wrong ingredients or falsely interpreting the cooking recipes (Kasavan et al., 2019).

Scholars have suggested the provision of takeaway containers such as “doggy bags” to reduce the amount of food waste by encouraging customers to take their unfinished food away with them (Martin-Rios et al., 2018; Sirieix et al., 2017). Although the general public knows and understands the idea of “doggy bags” and the relationship between “doggy bags” and food waste reduction, some are reluctant to ask for the food to be taken away. The respondents from the studies have expressed that such actions of asking for “doggy bags” are shameful because they may be seen by others as customers with financial problems. Social norms in some cultures perceive that the action of taking leftover food usually happens in low-scale restaurants, and it suggests that the person who asks for the food to be packed away is financially insecure (Sirieix et al., 2017). Some hotels also lack a takeaway policy, or the nature of the food they provide in the restaurants makes it difficult for their guests to take away unfinished food, leading to situations like hotel employees having to reject the customer’s request for “doggy bags” (Goh & Jie, 2020).

In some cases, different departments in the hotel may have conflicts of interest, and their goals may not align. For example, the study of Papargyropoulou et al. (2016) reveals that the head chef from one of their interviews claimed that on the occasion of customers changing their minds last minute, booking departments do not usually understand the fact that kitchen has to plan and it is difficult to change menu items or the number of meals prepared last minute since they have to put their orders through purchasing departments and ensure it is the correct ingredients and quantity. Therefore, researchers have suggested that communications between departments are essential, and it could help combat food waste problems in hotels. For example, regular meetings between departments to resolve uncertainties and conflicts, share the latest information

among departments, introduce food prevention campaigns in each department, align goals and make food waste mitigation to the agenda of each department (Papargyropoulou et al., 2016).

World leading hotel groups and their food waste strategies		
Hotel group	Food waste prevention strategies	source
Accor	<ul style="list-style-type: none"> <li>• Launched 'Love Food, No Waste 'Campaign</li> <li>• Set goal of reducing food waste by 30% by 2020.</li> <li>• Optimising menus, stocks, and reorganising buffets</li> <li>• Encourage customers to visit the kitchen and learn "zero waste" recipes.</li> <li>• Donate unconsumed products to local associations.</li> <li>• Introduce 'Tool kit 'to track food waste.</li> </ul>	(Accor, 2019)
Hilton	<ul style="list-style-type: none"> <li>• Promised to reduce food waste sending to landfills by 50%.</li> <li>• Reuse leftovers as much as possible.</li> <li>• Hilton Dubai Jumeirah has introduced with modern technology to track avoidable waste accurately.</li> <li>• Launch initiatives to turn leftover bread into beer in specific locations.</li> <li>• Launch short documentaries to raise awareness of sustainability.</li> </ul>	(Hilton, 2020)

Hyatt	<ul style="list-style-type: none"> <li>• All hotels will complete food waste prevention training and introduce food waste prevention plans.</li> <li>• Double the donation of North America hotels with food donation programmes.</li> <li>• Inedible food waste will be used where feasible.</li> <li>• Launch of a 'Toolkit 'to help food waste prevention.</li> </ul>	(Hyatt, 2021)
InterContinental Hotels Group (IGH)	<ul style="list-style-type: none"> <li>• Implement Winnow AI-based technology to track and prevent food waste</li> <li>• Aiming to reduce food waste by 30% through Winnow system.</li> <li>• Reduce food waste going through a “Prevent, Donate and Divert” plan.</li> <li>• Shapes menus and develop food preparation techniques to help food waste prevention.</li> </ul>	(IGH Hotels & Resorts, 2019)
Marriott International	<ul style="list-style-type: none"> <li>• Roll-out food waste prevention and food waste reduction educational campaign</li> <li>• Aim to reduce landfill waste by 45% and food waste by half</li> <li>• Develop a food waste tracking Methodology</li> </ul>	(Marriott International, 2021)

Shangri-La	<ul style="list-style-type: none"> <li>• Installed Winnow to pilot food waste management in eighteen hotels.</li> <li>• Track food waste and adjust recipes to reduce waste.</li> <li>• Reduce overproduction.</li> <li>• Recycle unavoidable food waste by energy recovery and composting.</li> <li>• Shangri-la Singapore has installed Eco Digestive system to help speed up the decomposing process and reduce CO2 emissions.</li> </ul>	(Shangri-La Group, 2021)
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*Table 2. World leading hotel groups' approaches to food waste mitigation*

With the increase in awareness of the impacts of food waste, more hotels are focusing more on food waste mitigation (Filimonau & De Coteau, 2018). It could be shown by the effort of the leading hotel groups in the world in combating the enormous amount of food waste generation in the hotel and tourism sectors. Hotels have reviewed their menus and food production process in an effort to tackle the sustainability problem of food waste; table 2 illustrates the policies, commitments, approaches or targets and goals of the world's leading hotel groups in food waste prevention.

Accor Hotels have pledged to reduce food waste production by 30% in one of their nine commitments (Accor, 2019). They have reduced their food waste in several ways, including reviewing their production process by optimising menus, reusing leftovers food to make other recipes to avoid discarding food in good condition, donating usable food to local food banks, and raising the awareness of the hotel's staff, customers, and partners.

Hilton has committed to cutting the food waste sent to landfill by half in their managed operations by the year 2030, as Hilton announced in their 2030 Goals (Hilton, 2021). Hilton hotels are also trying to extend the lifecycle of the food by

covering leftovers into some other products, for example, turning leftover bread into beer by sending bread to local breweries (Hilton, 2020) and installing a system to turn food waste into water (Nicholls, 2011). It has also been reported that Hilton hotels in America are donating food to local charities to address food security problems (Kohn, 2019). Hilton also raises awareness of global environmental issues by launching the short documentary series "Extending Our Stay", which explains the topic of sustainability and some of the environmental impacts of hotel businesses (Hilton, 2021).

Hyatt has claimed to train their employees on food waste prevention as well as to introduce a food waste reduction plan (Hyatt, 2021). They also said to produce half the food waste by the year 2030 as compared to the figures from 2019. Hyatt also said to increase their food donation of excess food and to seek methods of composting food surplus. The hotel group has also shown an innovative way of reducing food waste generation in the case of Grand Hyatt Singapore. The hotel has certified to serve zero-waste dishes, in which they use all the edible parts of the ingredients in their dishes to prevent avoidable waste. They have also tried to avoid disposing of less appealing or damaged fruit by turning them into juices. Not only are the kitchen staff being trained to lower the food waste, but a committee is also formed to produce innovative ideas and approaches to help combat the food waste problem. Grand Hyatt Singapore has installed Food Waste Monitoring System to track the amount of waste generated from meal preparations (Grand Hyatt Singapore, 2021).

Alongside other hotels, Marriotts have also emphasised cutting their food waste generation (Marriotts International, 2021); they have worked with other hospitality groups and organisations, such as World Wild Fund (WWF), to develop a food waste tracking system. Hence aid the reduction of food waste from the kitchen. They have also put efforts into educating both the hotel employees and customers on the matter of food waste.

Shangri La Group has taken steps in food waste reduction by complying with their three steps approach, and hotels are developing food waste reduction plans, educating, and motivating employees in food waste mitigation and monitoring and reviewing the performance (Shangri-La Hotels & Resorts, 2017). They have

also reported donating more than seven hundred tonnes of food waste to local organisations and converting used cooking oils into by-products like candles and biodiesel (Shangri-La Hotels & Resorts, 2017). Shangri-La Hotels and Resorts are not only preventing food waste by avoiding overproduction, improving recipes, planning , storage, and handling, they are also recycling unavoidable food waste through energy composting and recovery (Shangri-La Asian Limited, 2021).

Despite the common approach to food waste prevention, hotels are seeking innovative ways to food waste management (Martin-Rios et al., 2018). Leading hotels, including Accor, Hilton, Hyatt, IGH Hotels and Resorts and Marriotts International, are collaborating with World Wildlife Fund and Greenview to find a new methodology in food waste management and to minimise its impact on the environment (Adams, 2021). They have worked together to develop the Hotel Waste Management Methodology, which is to help hotels to reach their sustainability goals by providing the hospitality industry with a consistent framework of food waste tracking methods, filling in the data gaps and enabling industry benchmarking as well as public annual reporting (WWF, 2021). The methodology standardised waste metrics and waste factors for hotels helped hotels in measuring and reporting waste consistently, as well as setting targets and objectives for the hotels to track their progress. The Toolkits have proven useful in reducing hotel food waste by around 10-38% in four months (Hotel Kitchen, 2019).

On the other hand, some hotels from Hilton, InterContinental Hotels Group and Shangri-La Group have implemented AI-based technology, Winnow vision to track and prevent food waste generation in hotels (Hilton, 2020; IGH, 2019; Shangri-La Group, 2021). The food waste management technology keeps track of and analyses the food which has been discarded in the kitchen automatically. It then provides insights and records of kitchen waste (Winnow, n.d.).

Due to the surge in food waste in the hospitality industry, waste management, food waste management, in particular, is being discussed increasingly often by scholars in recent years (e.g., Dhir et al., 2020; Filimonau & de Coteau, 2019; Martin-Rios et al., 2018; Munir, 2022). In one recent study, (Filimonau & de

Coteau, 2019) remarks that effective food waste mitigation implementation, such as enhancing food logistics, storage, and preparation, could minimise the cost of waste disposal or collection in hotels. They also suggested that hotels donating untouched food to people in need could benefit from tax reduction as well as gain a good reputation by portraying the hotel as a business that helps combat the global sustainability challenge.

## **2.4 The Influence of Corporative Social Responsibility on Consumer Behaviours**

This section will discuss the idea of corporative social responsibility (CSR) of the company by addressing both the ideas and theories of CSR which have been mentioned in previous studies and literature. This is followed by how CSR on the societal and environmental side will impact consumers' choices when they are selecting the services or products out of all the choices in the market.

Corporate social responsibility (CSR) has been mentioned by scholars (Rahim et al., 2011, p.120) as a concept "*whereby organisations consider the interests of society by taking responsibility for the impact of their activities on stakeholders as well as the environment*". It is when businesses and organisations voluntarily take an extra step to improve the quality of life of their employees, communities as well as society. There are currently very few studies on how restaurant CSR is correlated to brand attitude, service quality and customer satisfaction (Lee et al., 2020). The concept of CSR can be divided into four categories, which were introduced with the idea of the CSR pyramid, and these include economic, legal, ethical, and philanthropic (Carrol, 1991).

Researchers have investigated CSR's role in the customer retention process. Lee et al. (2019) have studied four crucial factors of CSR in customer satisfaction and retention in food service businesses: economic, legal, ethical, and philanthropic. The research suggested that ethical CSR could directly affect the customers' brand attitude, ultimately leading to customer satisfaction and the customer's intention to revisit. Therefore, the business needs to consider ethics in its strategies to carry forward its sustainable development. On the other hand,



researchers (Lee et al., 2020) have brought the theory into the field of food and beverage context. They have evaluated the relation between the four CSR factors and the brand attitude, customer satisfaction and service quality of the restaurant guests and results suggested that ethical CSR activities of a restaurant have a significant effect on the brand attitude and service quality. The study also found that Ethical CSR has the strongest relationship with brand attitude and service quality compared to other CSR levels. Hence, it is vital for restaurants to meet the ethical and moral expectations of the customers when operating the business, as it represents the CSR activities of the business.

In some consumption markets, firms and businesses use CSR activities to build their companies' image and to strengthen their reputation (Nadanyiova, 2021), companies are implementing CSR activities to gain a competitive advantage by receiving better feedback from stakeholders and customers. Half of the respondents from the study prefer products from socially responsible companies, especially in the case of food, cosmetic and some other services. The study's result implies that businesses that effectively introduce CSR activities in their business strategy would benefit from maintaining a better business image, customer relations, and customer loyalty.

Increasing worries about social and environmental issues have emphasised the need for corporate social responsibility (CSR) engagements in the hotel and tourism sector (Koseoglu et al., 2021). In their study on the CSR of hotel and tourism sectors, they noticed that there is room for improvements of the organisations in the industry, while businesses in the sector are trying to meet their stakeholders' expectations by committing to CSR. Nonetheless, food waste is not considered unethical by a handful of frontline hospitality staff (Goh & Jie, 2019). It has led to the question if hotels are providing enough ethics training to their staff. Another study was conducted to test the relationship between CSR and customer loyalty in the hotel industry (Latif et al., 2020). The study has explored in three different consumer markets. The research investigated the Pakistani, Chinese and Italian markets. The study's result suggested that the hotel's CSR activities have a direct positive correlation with service quality, corporate image, customer satisfaction and corporate reputation. However, the correlation between CSR and customer loyalty has a moderate to weak

association as it only shows partially significant effect in the sample of China and is insignificant in the Pakistan and Italy market. The result shows that cultural differences and social norms may influence the customer's perception of CSR of the hotels. Therefore, the association between CSR and customer loyalty varies in different consumer markets.

### **3. Methodology**

#### **3.1 Research design**

The research consists of two main parts. The first part aims to determine the influences of the hotel's food waste mitigation approaches on the brand attitude perceived by customers. As suggested by previous studies and literature, there are several reasons for food waste generation in hotels, including types of meal services (Camilleri-Fenech et al., 2020; Dolnicar, Juvan and Grün, 2020; Jeswani et al., 2021; Juvan, Grün & Dolnicar 2017; Papargyropoulou et al., 2019), reduction in portion sizes (Engström & Carlsson-Kanyama, 2004; Filimonau et al., 2021; Jeswani et al., 2021; Kantor et al., 1997), improved employee food preparation skills (Dhir et al., 2020; Kasavan et al., 2019), and waste management (Dhir et al., 2020; Filimonau & De Coteau, 2019; Filimonau, 2020; Principato et al., 2018; Martin-Rios et al., 2018; Okumus et al., 2020). Hence, the four food waste reduction approaches will be asked in the research to determine if respondents find it vital for them if the hotel is taking those approaches to reduce the amount of food waste generation in the operations. Four hypotheses proposed here to test the significance of the four mitigation approaches.

**Hypothesis 1:** A change in meal service style positively affect brand attitude.

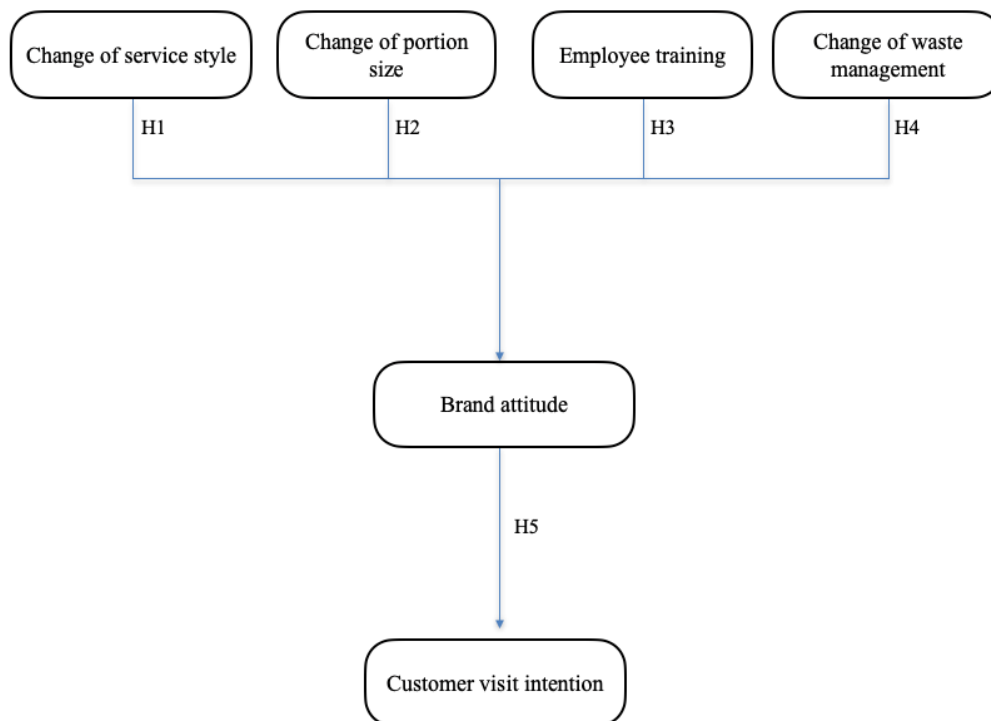
**Hypothesis 2:** A change of portion size positively affects brand attitude.

**Hypothesis 3:** Providing training to hotel employees can positively affect brand attitude.

**Hypothesis 4:** An improvement in waste management can positively affect brand attitude.

The second part of the research aims to test the correlation between the customers' brand attitude and their intention to visit the hotel. This part aims to investigate if customer decisions would be affected by the brand attitude of the customers towards the hotel and if customers would return to the business because of their attitude towards the brand. The following hypotheses are proposed:

**Hypothesis 5:** Brand Attitude positively affects customer visit intention.



*Figure 1 Theoretical model of the framework of the research*

Figure 1 shows the proposed theoretical model of the framework of the research. The structure of the research will be following the steps shown in the model.

Given this research's purpose, a quantitative research design was implemented to gain a better understanding of the topic from the hotel customer perspective. A self-completion survey questionnaire helps acquiring the first-hand response from respondents. Specific designed questions intended to focus on the topic

while collecting respondents' information more accurately. “Self-complete” refers to method that could be done by respondents his/herself, without any necessary interactions or intervention of the researchers (Want et al. 2021).

To achieve that, the survey will be conducted online with the help of online survey tools. The online survey could reduce data collection time and efforts of the research since multiple surveys could be done at the same time. In addition, respondents' replies will stay confidential, therefore the opinions and replies from the participants are less affected by other emotional factors. Hence, results of the data collected are less biased and more authentic. Conducting survey online could also reduce geographical dependents, thus it is capable of gathering boarder range of data and allowing flexibility in the data analysing.

### **3.2 Survey development**

The survey consists of three main sections. The first section aims to explore the impact of food waste mitigation approaches on the brand attitudes of the hotel. This part of the survey contains four variables, three items or food service style variable (e.g., “It is important for a hotel restaurant to review the food waste generation from different types of meal service”), three items for portion size variable (e.g., “It is important for a hotel restaurant to review its portion size”), three items for employee skills (e.g., “It is important for a hotel to train their staff on reducing food waste”) and three items for waste management variable (e.g., “It is important for a hotel to review its waste management)

The second section intended to acquire information regarding the respondents' perception of the food waste problem in hospitality industry and their decision making. This part of the survey aimed to investigate the effect of the hotel's food waste prevention, or practices influence the customer booking intention. Following the measurement of booking intention of customers in extant literature by Ju and Jang (2022), the variable will also be measured in a seven-point Likert scale. (e.g., “I prefer staying in hotels which they are proactively in food waste mitigation”)

Current studies on hospitality and consumer behaviours (i.e., Lee et al. 2020; Oliver, 2010) have measured with a seven-point Likert scale ( [1] “strongly disagree - [7] “strongly agree”). Except the first section of the survey, in which multiple choices are given to obtain the demographic information of the respondents of the questionnaire, the remaining questions will adopt the seven-point Likert scale for more reliable evaluation of the results.

The final part of the survey aims to collect basic demographic information of the respondents of the survey, such as age and gender. Following the previous study on the importance of corporate social responsibility on consumer behaviours (Rahim et. al., 2011), the survey collects age, gender as well as the number of times of respondents visit a hotel per year. Therefore, this survey will also ask respondents the how many times do they visit or stay in a hotel in a year.

### **3.3 Data collection and analysis**

This research aims to acquire a sample size of 120 respondents within four weeks window. Respondents are fully voluntary and are anonymous. Invitation link of the survey were be sent via email and various social media, such as Facebook, LinkedIn, and WhatsApp. A convenience sampling method was applied.

The survey aims to be completed in less than ten minutes, and respondents were be encouraged to respond with their first thoughts. This is to prevent over interpretations of the questions by respondents and reduce the possibility of obtaining a biased answer. The survey was carried out in English. However, an identical version would also be conducted in Chinese to acquire a larger sample group and allow respondents to choose his/her preferred language to answer.

After data and response have been collected, specific behaviours and variables would be tested by computing the correlation and regression analysis test (e.g., Brand attitude significantly affect customers' intention to visit the hotel). Several aspects would also be examined and evaluated, including the samples' usefulness, representativeness of the sample selected, the sample's reliability and data collected etc. Ultimately, the data collected would answer the hypothesis of the research question. For more accurate research results, the PSPP application was utilised in statistical testing and storing process.

## 4. Results and discussion

### 4.1 Sample Characteristics

The survey captured the responses and data from 106 respondents in total. More than 160 survey invitations were distributed through multiple platforms, including Emails, Linked In, WhatsApp Instagram. However, some did not participate in the questionnaire, and some submitted with blank responds. Demographics information such as gender, age, employment status and frequency of hotel visits per year are acquired. Table 3 shows the summary of the demographic information of the respondents from this survey.

<b>Gender</b>	<b>Percentage (%)</b>
Male	57
Female	43
<b>Age</b>	
Below 20	2
21-30	67
31-40	16
41-50	6
Above 51	9
<b>Employment Status</b>	
Part-time	12
Full Time	67
Student	13
Retired	2
Unemployed	6
<b>Number of times of hotel visits per year</b>	
Less than 2	9
2-4	40
5-7	28
More than 7	17

Table 3. Summary of sample characteristics

In total, male represents 57% of the respondents and female represents a portion of 43%. Respondents are classified into five age range, the majority of the respondents are from the 21-30 age group, with 67% of the respondents from this age category. Following by respondents aged between 31-40 years old, with 16%. Only 9% of the responds are coming from people with age above 50, whereas respondents whose age is below 20 at the survey period is the minority (2%).

Most of the respondents of this survey are working as a full time (67%), 13% of the respondents are students at the time of the survey and 12% are claiming to be working as a part-time. Unemployed (6%) and retired (2%) are less presented from this survey. When asked about the number of visits or stay in hotels per year, the majority (40%) responded 2-4 times and slightly above one quarter of respondents claimed to be going to hotels 5-7 times per year. The data also shows that 17% of the survey participants going to hotels more than seven times in a year, whereas 9% of respondents visit or stay in a hotel less than two times in a year.

#### 4.2 Reliability and validity

Reliability of the variables have been assessed with Cronbach’s alpha and Composite Reliability (CR). Cronbach Alpha coefficient tested the internal consistency of the variables, measuring how closely related the variables are within each construct, thus giving the estimation of the accuracy of the measurement of the group of items. The statistical software PSPP is used to calculate the Cronbach’s alpha as well as the Composite Reliability of the variables. The results are shown in table 4.

	$\lambda$	Alpha	CR	AVE
<b>Food service style 1</b>	0.84	0.66	0.80	0.64
<b>Food service style 2</b>	0.72			
<b>Food service style 3</b>	0.83			

	$\lambda$	Alpha	CR	AVE
<b>Portion size 1</b>	0.69	0.68	0.74	0.60
<b>Portion size 2</b>	0.84			
<b>Employee training 1</b>	0.72	0.80	0.83	0.62
<b>Employee training 2</b>	0.78			
<b>Employee training 3</b>	0.85			
<b>Food waste management 1</b>	0.82	0.78	0.88	0.61
<b>Food waste management 2</b>	0.85			
<b>Food waste management 3</b>	0.66			
<b>Visit intention 1</b>	0.77	0.88	0.78	0.64
<b>Visit intention 2</b>	0.83			
<b>Brand attitude 1</b>	0.64	0.87	0.89	0.67
<b>Brand attitude 2</b>	0.82			
<b>Brand attitude 3</b>	0.87			
<b>Brand attitude 4</b>	0.91			

*Table 4. Items loading, reliability and validity*

The alpha of the first two constructs, the service style of the hotels' restaurants and portion size, is sitting between 0.6 and 0.7, which is the acceptable level of reliability (Ursachi et al., 2015). In contrast, the other items have an alpha greater than the recommended value of 0.700, indicating proficient level reliability of the variables. The Composite reliability (CR) figures were calculated by



computing equation (1), the results show a prominent internal consistency. From the data results, all the composite reliability for the constructs ranges from .74 to .89, surpassing the threshold level of 0.70. Thus, suggesting the constructs are constant with the measures. The average variance extracted (AVE) has been used to validate constructs by assessing the discriminant validity of the latent variables. The AVE was calculated using the equation (2), the AVE suggests the average of estimated indicator reliability. The results indicate that all the AVEs have exceeded the recommended level of 0.50, suggested by Hair et al. (2010). Therefore, the reliability and validity of the constructs in the research are supported.

$$CR = \frac{(\sum \lambda_i)^2}{(\sum \lambda_i)^2 + \sum (1 - \lambda_i^2)} \quad (1)$$

$$AVE = \frac{\sum \lambda_i^2}{(\sum \lambda_i^2) + (\sum 1 - \lambda_i^2)} \quad (2)$$

Whereby, CR stands for composite reliability. AVE represents average variance extracted. Lambda ( $\lambda$ ) denotes to the standardised factor loading for item  $i$ .

### 4.3 Statistical testing of the data

The Pearson product-moment correlation coefficient measures the strength of the relationship between two continuous variables. The statistical test examines the association of one variable towards the other tested variable. Therefore, it also provides the direction of linear correlation of the tested data. The Pearson correlation coefficient test was initially chosen for analysing the data in this research because of a few reasons. First, it is less complex and straightforward. It treats all variables the same, and it excludes the consideration of whether the variables are independent or dependent, which means the variables can be tested in both directions and give the same results, so there is less chance of mistakenly interpreting the data compared to other statistical testing methods. The line of best fit could be drawn on the graph for better visualisation, hence more accessible under the relationship and direction of the correlation.

Moreover, instead of just measuring if the two variables are correlated, it also measures the magnitude of the association. The Pearson correlation coefficient test also makes no assumption on the variables behind; it can be measured in any unit and is best for scale data. The Pearson correlation analysis has been used in previous research by Thomas and Tahir (2019), studying the effect of CSR towards consumer buying behaviour. The study also measures the constructs in scale variables and tests the assumption against the relationship of one variable, making a significant effect on another variable. Thus, for a more valid results interpretation and data analysis for this research, the Person correlation coefficient test is chosen.

Before running a correlation test for the variables, the normality of the data is tested. The Shapiro-Wilk test is being conducted to determine if the variables are normally distributed. As shown in Table 5, all the tested variables are not normally distributed. The results of Foodservice style, portion size, employee training, food waste management and respondents' intention to visit have all shown a p-value of less than the significant level of 0.005, which means the data collected from these variables do not fit the assumption of the data being normally distributed in the population. However, there is an exception for brand attitude, and the Shapiro-Wilk tests did not show a significant difference from the normal distribution  $W(106)=.976, P=.051$ . Since  $p>.05$ , the null hypothesis is retained, and the data are assumed to be normally disturbed.

	<b>N</b>	<b>Mean</b>	<b>Std Dev</b>	<b>Kurtosis</b>	<b>Skewnes s</b>	<b>P Value</b>	<b>W Value</b>
<b>Food Service Style</b>	106	5.22	1.01	0.81	-0.45	0.002	0.96
<b>Portion Size</b>	106	5.25	1.16	0.38	-0.79	>0.001	0.92
<b>Employee Training</b>	106	5.65	1.14	2.48	-1.54	>0.001	0.84
<b>Food Waste Management</b>	106	5.75	0.99	6.43	-2.05	>0.001	0.81
<b>Intension to visit</b>	106	4.61	1.43	-0.25	-0.43	0.003	0.96

	N	Mean	Std Dev	Kurtosis	Skewness	P Value	W Value
<b>Brand Attitude</b>	106	4.56	1.32	-0.11	-0.38	0.051	0.98

Table 5. Results of the Shapiro-Wilk test

#### 4.4 Hotel food waste approaches and brand attitude

After testing the normality of the variables, nonparametric statistical tests will be used to test hypotheses. The Spearman's Rank Correlation test is selected to measure the strength and direction of the association between the four food waste factors in hotels and brand attitude, the nonparametric equivalent to the Pearson correlation. Scholars Dancey & Reidy (2004) have suggested a guideline for interpreting Spearman's correlation, the magnitude or strength of the relationship: negligible =  $\rho(0.01-0.19)$ ; weak =  $\rho(0.20-0.29)$ ; moderate =  $\rho(0.30-0.39)$ ; Strong =  $\rho(0.4-0.69)$ ; and very strong =  $\rho(\geq 0.70)$ .

As shown in table 6, the results of Spearman's correlation between the food service style and brand attitude indicate a strong positive correlation between the two variables  $r(104) = .49, p < .001$ , which suggested that the more the respondents agree that changing food service style can reduce food waste, the better brand attitude they have towards a brand. The result of the Spearman's correlation also shows that the result for the food service style is significant, therefore

H1 is retained, revealing that change in food service style positively affects brand attitude.

However, the change in portion size has a non-significant correlation with brand attitude  $r(104) = .15, p = .137$ . The results suggest that hotel restaurant changing their portion size has a negligible effect on brand attitude. Since the  $p$ -value of portion size is greater than the significant level of 0.1, the hypothesis of H2 is rejected. Therefore, changing portion size to reduce food waste in hotels does not positively affect brand attitude.

Hotel employee training in food waste mitigation has shown a positive relationship with the brand attitude  $r(104) = .34, p < .001$ . The result shows a

moderately significant association between the two variables, which implies that providing hotel employees with knowledge of food waste handling and training in minimising food waste would improve how customers view the brand. The p-value also shows a significant assumption testing. Therefore, it rejected the null hypothesis of H3 and the hypothesis that providing training to hotel employee positively affect the brand attitude is retained.

Lastly, food waste management also positively correlates with brand attitude  $r(104) = .34, p < .001$ . There is also a moderately significant association between the two variables. Suggesting that hotel food waste management positively influences the attitude toward a brand. The p-value also shows that the finding is significant. Thus, the hypothesis of H4 is retained, implying that improvement in food waste management positively affects the brand attitude.

	<b>Spearman's Correlation</b>	<b>t-value</b>	<b>Sig.</b>
<b>Food Service Style</b>	0.49	5.67	<0.0001
<b>Portion Size</b>	0.15	1.5	0.1366
<b>Employee Training</b>	0.34	3.7	0.0003
<b>Food Waste Management</b>	0.34	3.68	0.0004

*Table 6. Spearman's rank correlation between the four food waste approaches and brand attitude.*

#### **4.5 Brand attitude and visit intention**

After understanding how food service style, portion size, employee training and food waste management in hotels affect brand attitude, the effect of brand attitude and customer intention to visit is examined. As shown in table 7, the results show a strong positive correlation between the two variables and the difference is considered statistically significant  $r(104) = .80, p < .0001$ . The result implies that the better the brand attitude, the more willing the customer will visit or stay at the hotel again. The p-value also suggested that this result happened by chance and was exceedingly small. Therefore, the hypothesis for

H5 is confirmed, indicating that brand attitude positively affects customer intention to visit

	<b>Spearman's Correlation</b>	<b>t-value</b>	<b>Sig.</b>
<b>Brand Attitude</b>	0.80	13.80	<0.0001

Table 7. Spearman's correlation between brand attitude and customer visit intention

#### 4.6 General discussion

The current study aimed to examine the effect of the hotel's food waste mitigation approaches on the customer intention to visit the hotel. To address RQ1, the relation of hotels' food waste reduction approaches and brand attitude is examined. In the aspects of food service style (H1), employee training (H3) and food waste management (H4), results have found these food waste mitigation approaches by the hotel can positively affect the brand attitude. This result is coinciding with prior research by Lee et al., (2020) reporting a significant and positive relation between ethical CSR and brand attitude. However, reducing the portion size (H2) to tackle food waste issue has not been found to have a significance effect with the brand attitude, suggesting that reducing portion sizes of their dishes in hotel restaurants does not affect customer's attitude to the hotel.

The RQ2 is responded by examining the relation of brand attitude and customer intention to visit the hotel (H5). The result aligned with the findings from Wu and Wang (2014), who stated that brand attitude could affect the customers' willingness to purchase. When customers making purchasing decisions, they consider their brand preference, therefore, their decisions is determined by brand attitude.

#### 4.7 Limitation

This research had a few limitations which needed to be addressed. Firstly, the sample of the study may not accurately represent the greater population due to the sample size as well as the profile of the sample. This survey only captured

the responses from 106 participants, whereas previous studies on consumer buying behaviours in relation to CSR managed to obtain a sample size of more than 200 (i.e., Lee et al., 2019; Nadanyiova, 2020; Thomas & Tahir, 2019). A small sample size reduces the statistical power of a study since a smaller sample size increases the chance of Type II errors (Deziel, 2018). Type II errors occurred when the hypothesis was accepted by the results of assumption testing when, in fact, the alternative hypothesis was confirmed. This implies that there is also a probability that Type II errors occurred in this research study, therefore challenging the reliability of the results and outcomes of this research. Nonetheless, the small sample size is caused by the short data collection time due to the limited timeframe. Although much more survey invitations were sent and spread, by the time of analysing the data, there were only 106 responses. Lack of interest and awareness in the topic could also be why surveys are not answered.

As scholar Krithikadatta (2014) suggested, the sample size significantly affects the sample distribution. The sample size being too small leads to a lack of estimation of the data dispersion, causing the data to be not normally distributed. When looking at the characteristics of the sample, as shown in table 3, a majority of the respondents are from the age category of 21-30. The respondents' age is relatively too concentrated in one group. Hence opinions and responses might be biased to one side, and responses from other age groups were not represented in the results. This is potentially caused by the convenience sampling method used in the data collection process. Although convenience sampling requires less time and resources to generate large data samples compared to other sampling methods, biased samples are easy to create, and the findings usually only represent one population group (Gaille, 2020). Therefore, the research findings only reflect one specific demographic group rather than representing the entire population. However, the chosen sampling method was under the constraint of time and resources for the research.

There also needed to be more clarity concerning the scope of the discussion. Due to the limited access to the data and literature, some topics and issues discussed in previous studies may need to be included. In addition, due to the lack of experience in conducting research and writing academic papers of such large

size, the depth of the discussion and analysis may not be well compromised compared to the works of much more experienced scholars.

#### **4.8 Managerial Implications**

The findings of this research survey provide some inspiration and suggestions for hotel managers, demonstrating that specific food waste mitigation approaches could implicitly acquire a higher customer visit intention rate. Hotels restaurants could approach the food waste problem from the perspective of service style, their staff training and food waste manager to improve customer attitude toward the brand. Hotels restaurants review and change their food service style for less food waste generation, for example, changing their food service style from buffet style to a le carte style. Hotels could also provide more training in food waste handling skills for their employees to restore and gain brand trust. Moreover, a proper food waste management system to monitor and prevent food waste at the hotels can be valuable in gaining a better brand attitude and customer intention to visit the hotel.

### **5. Conclusion**

The present research makes an effort to understand the effect of the food waste mitigation approaches of the hotels on customer visit intention.

The topic of food waste in the hospitality industry was discussed with definitions of the terminologies and examples of food waste. Four commonly considered food waste factors in the hotels have also been elaborated as well as the mitigation approaches of the hotels.

The results of this study demonstrated that change in food service style, providing employee training in food waste handling and improving food waste management has a significant relationship with brand attitude. However, changing the menu's portion size to reduce food waste had insignificant effect on brand attitude. Additionally, results of the current study have demonstrated a strong association between brand attitude and customers visit intention.

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